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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

INSECT INFESTATIONS ON CUTOVER LANDS IN THE VICINITY OF LOYALTON CALIFORNIA TAHOE NATIONAL FOREST

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1927

Stanford University, California
November 9, 1927

GOVERNMENT PRINTING OFFICE

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INSECT INVESTATIONS ON CUTOVER LANDS IN VICINITY OF LOYALTON, TAHOE NATIONAL FOREST

In June, 1927, Mr. Woodbury reported that the timber area south of the town of Loyalton contained a noticeable number of trees dying from the attacks of Dendroctonus and Ips beetles, and that trees were also suffering from mistletoe and porcupine injury. He suggested that the Bureau of Entomology make an examination of the situation. The area was visited by the writer September 22 and 23 while on the return trip from the insect survey on the Inyo National Forest. This examination was confined to two small areas along the northern edge of the timber type south of Loyalton. An effort was made to determine the conditions and insects responsible for the more conspicuous damage, but no attempt was made at a general survey of conditions in the region.

Character of Problems Encountered

The areas most seriously affected by insects in this region are those that have been cut over. Recent logging operations, as well as lands cut over a number of years ago, are affected. The virgin timber in this region is composed of mixed stands, mainly yellow pine with a considerable mixture of white fir, incense cedar and some sugar pine. The site quality is very poor, and the forest generally shows evidence of very unfavorable growing conditions, which is especially noticeable in the second-growth stands.

Two problems, differing decidedly in character, were noted in this examination. These are:

1. Considerable loss in all tree species on areas cut over by private lumbering concerns some ten to twenty years ago. This condition included both the older trees left on the ground at the time of logging and the reproduction that was on the ground or has come in since the logging operation.

2. Killing by Ips outbreaks of yellow pine pole and reproduction stands immediately around areas that have been recently logged. The Ips attacks occurred during the same season as the logging operation.

CONDITIONS ON THE OLD CUTOVER AREAS

One locality where this type of damage is conspicuous is on the Smithneck Creek drainage, about one mile below the old Columbia mill site. The age of this cutting was not determined, but I should estimate that it occurred about fifteen years ago or perhaps earlier. Apparently the area was logged with the object of taking off only the best merchantable timber, leaving inferior or inaccessible trees. A considerable amount of white fir and incense cedar was

left. Yellow pine seems to have been cut much more closely, leaving only defective trees or those on inaccessible slopes. Insect damage is now occurring both in the mature trees left from cutting and in the reproduction that is restocking the area.

a. Loss of Mature Trees Left After Logging

A count was made of the redtopped and fading trees on an area estimated at about 160 acres. The approximate location, according to the drainage features on the National Forest map, is in Sec. 5, T 20 N, R 16 E. The following are trees 10" D.B.H. and over, representing approximately two years of annual loss:

Yellow pine - - - - -	21
Incense cedar- - - -	27
White fir - - - - - -	31
Total -	79

This represents a loss of 316 trees per section for 1926 and 1927, or about 158 trees annually.

This loss, insofar as insects are responsible, is due to the following:

In yellow pine - western pine beetle, Dendroctonus brevicomis

The infestation of this species seems to have increased measurably since 1924. There is a fair proportion of 1927 summer brood trees, which indicates that there has been no marked decline in the infestation for the 1927 season.

In white fir - Engraver beetle, Scolytus subscaber

This insect is killing the tops of mature trees and groups of entire trees in pole stands. Many of the larger trees die from borer attacks in a few years below the dead top, so that the entire tree is killed.

In incense cedar

Roundhead borer work (Hylotrupes ligneus) was the only insect found in the larger trees. It is doubtful, however, if these insects are primarily responsible for the widespread killing of incense cedar.

b. Loss in Reproduction

Yellow Pine. This species, aside from the Ips outbreaks described later, has very few dying trees in the smaller-diameter classes; there is, however, a great deal of mistletoe and porcupine injury. Growth rate is very slow, even in groups where there is little competition. The most unfavorable growing season in many years was that of 1924. In nearly all trees examined a barely perceptible ring was formed that season. The 1925, 1926 and 1927 rings

are much better and not greatly below the average for preceding periods.

White Fir. The engraver beetle, Scolytus subscaber, and a small twig beetle are found in nearly all dying trees. In this host the insects appear to be primary, but they have apparently taken advantage of the unfavorable growth in the younger trees.

Incense Cedar. A cedar barkbeetle, Phloeosinus sp., is present in a number of the younger dying trees, but they appear to be largely secondary. There is some evidence of a disease that is causing considerable mortality among the smaller trees.

The conditions on these old cutover lands are such that considerable study must be given to the various problems before a satisfactory analysis can be made. The situation will require an approach from a pathological as well as an entomological angle. It is evident that the loss is now severe, and unless conditions improve materially a very unsatisfactory restocking of these old cutover areas will result.

IPS OUTBREAKS IN YELLOW PINE REPRODUCTION AND POLE STANDS

An area where this type of damage is quite striking was noticed about two miles west of the town of Loyalton, just south of the Sierraville road. Evidence on the ground indicated that a small tract, not exceeding forty acres, was logged in the spring or early summer of 1926. All mature merchantable trees were cut, the logs hauled away and the slash left unpiled on the ground. In the late summer and fall of 1926 large groups of yellow pine reproduction and pole stands were attacked and killed by Ips oregonis. The groups that developed in and around this particular logging tract covered approximately ten acres, on which practically all trees were killed.

Another area of similar damage was noticed on the Smithneck drainage about three miles out of the town of Loyalton, but no examination was made.

The slash, consisting of tops, limbs and a few small logs, developed a fair brood of Ips beetles, which emerged during the latter part of the season. These beetles then attacked the standing trees in the vicinity, and the second generation apparently overwintered in the small trees that were killed. There was some emergence of this generation in the spring of 1927, but no more trees were attacked. The outbreak has now entirely subsided, being confined to the single season of 1926.

This type of damage on a much smaller scale was also noticed in this locality in 1910, when I examined a Forest Service sale area with Ranger Babbitt. In this case the brush had been piled and the reproduction immediately around the brush piles had been attacked by Ips. The amount of damage, however, was not nearly so extensive as that which developed in 1926. Poor site conditions apparently

have something to do with this trouble, as it has rarely been noticed on good yellow pine sites.

Pis outbreaks of this character apparently occur only where sporadic logging operations are conducted. If logging had been continuous during the summer the beetles would probably have gone into the fresh slash instead of into the standing trees.

An obvious remedy is apparent, if the logging had been carried on late in thesummer and fall and the brush burned before emergence of the beetles the following season.

SUMMARY

Two important insect problems were encountered during a brief field examination of cutover areas in the eastern Tahoe.

Of first importance is the sustained loss in all yellow pine, white fir and incense cedar on old areas cut over by private lumbering operations. Both mature trees and reproduction are affected. Several species of barkbeetles are responsible for a considerable amount of this loss, but the problem is complicated by unfavorable site conditions and the presence of forest diseases.

Yellow pine reproduction and pole stands were killed by Ips oregonis over small areas where logging operations were carried on in 1926. These outbreaks developed because of the fact that logging was discontinued during the summer, and beetles emerging from the slash late in the season attacked standing trees in the vicinity. This trouble is of brief duration and subsides the first season following the outbreak.

PHOTO NO. 1

An area about seven miles southeast of the town of Loyalton, Calif., cut over by early logging operations. The mature trees are those left after cutting. The trees showing in a light contrast are those with sorrel and red foliage which died during 1926 and 1927. This loss is about evenly divided between white fir, incense cedar and yellow pine. Second-growth stands in the foreground contain considerable insect loss not showing in this picture.

PHOTO NO. 1

PHOTO NO. 2

An area about two miles east of Loyalton logged during the early season of 1926. The area where the cutting was done is in the center and to the right of photo. A very high percent of the yellow pine reproduction and pole stands left after logging was killed by Ips oregonis during the fall of 1926.

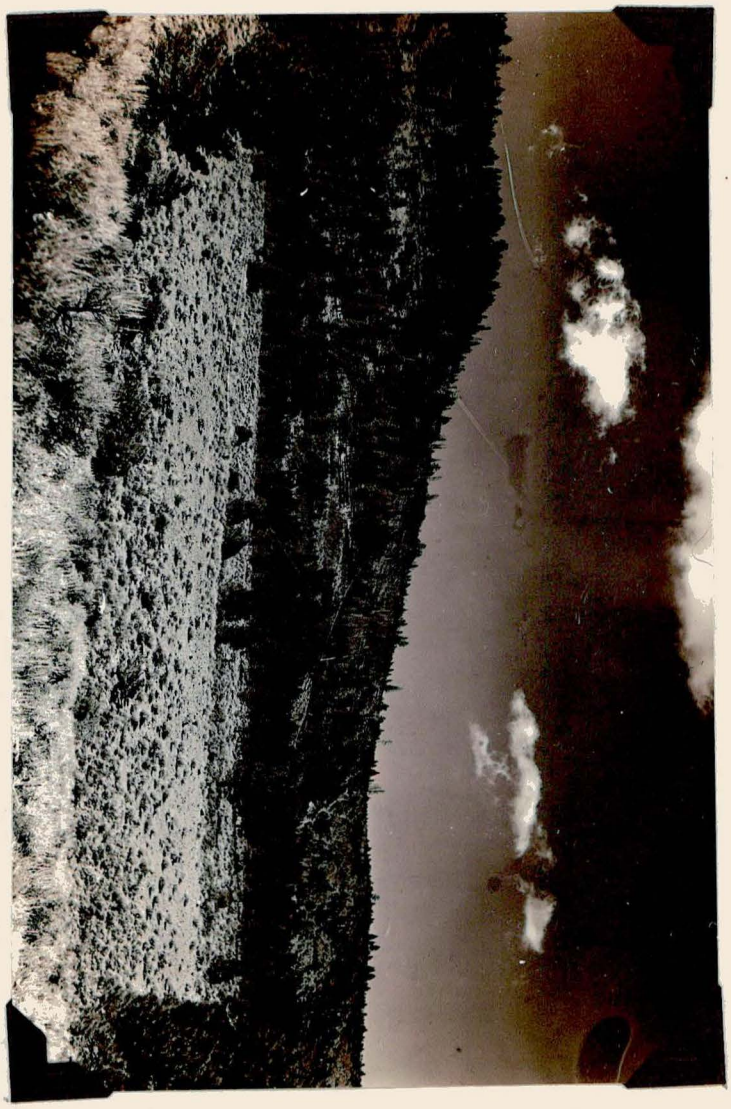

PHOTO NO. 2

PHOTO NO. 5

View of one of the larger groups of young yellow pine killed by Ips oregonis on area logged during the early summer of 1926. The beetles causing this attack appear to have come from tops and limbs of logging debris left on the area. The attack occurred in the late summer of 1926. No attacks occurred during the 1927 season.

PHOTO NO. 3

PHOTO NO. 4

Section of 6" yellow pine killed by *Ips oregonis* during the fall of 1926. This tree was on the area logged during the spring of 1926. The very narrow ring represents growth made during the 1924 season; this narrow 1924 ring is characteristic of all yellow pine trees on the area. In some trees it appears to be almost entirely lacking.

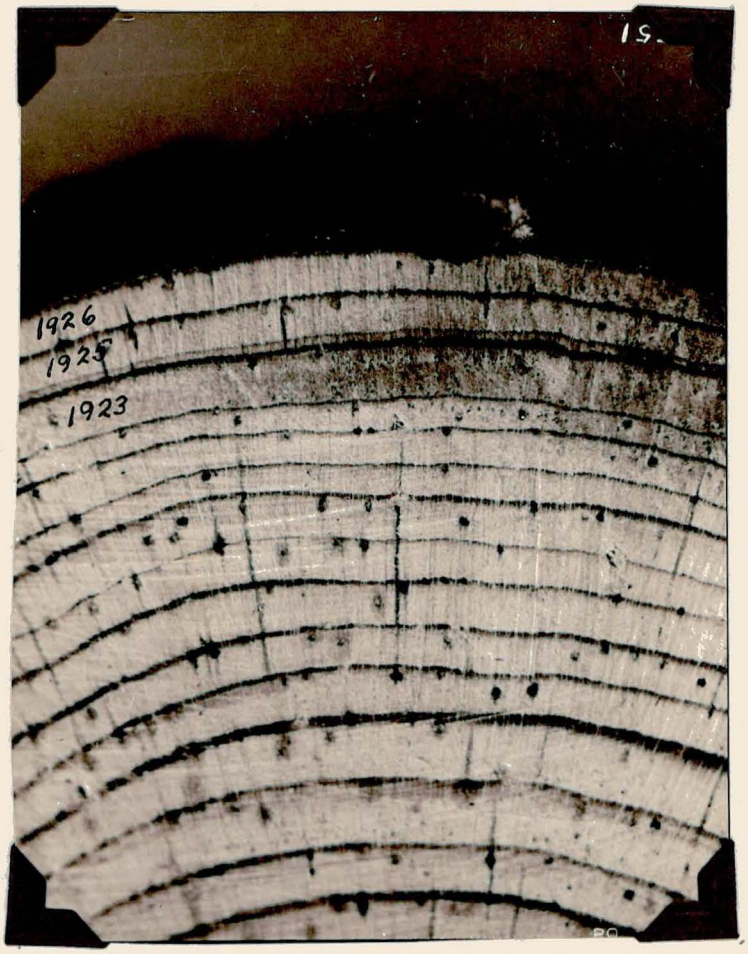

PHOTO NO. 4